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CHAPTER 6.0 REVIEW OF SELECTED RESEARCH ON NURSING HOME STAFFING AND RESIDENT OUTCOMES¹

6.1 Introduction

The relationship between staffing levels and resident outcomes is not a new topic and has been the subject of several research studies with expert meetings reviewing these studies. One such meeting of experts, referred to in previous chapters as the Hartford experts, has reviewed this research and made recommendations about appropriate minimum nurse staffing ratios, including recommendations of a minimum of 4.55 total nursing hours per resident day, as was discussed in Chapter 3. These recommendations were published in a recent issue of the *Gerontologist* (Harrington et al., 2000). In addition to recommended minimum nurse staffing ratios, the Hartford statement also made recommendations with respect to education and training, and the use of nurse practitioners, a recommended staffing issues that is outside the scope of our present study.

As was discussed in Chapter 1, expert consensus is one of the three research strategies that can be used to address our general study question of appropriate minimum staffing ratios. Although we have not assembled an expert panel to make recommendations, the Hartford experts were convened recently in April 1998 and their recommendations were published this year, 2000. We draw upon their published statement here in this chapter. In addition, our review of research on the relationship between nurse staffing and quality outcomes will reveal that the bulk of this research has been

¹ Sections 6.1, 6.2, 6.4, 6.5, and 6.7 of this chapter were written by Marvin Feuerberg, HCFA. Section 6.3 was written by Karen Reilly, Abt Associates. Valuable comments and suggestions were provided by Andy Kramer, University of Colorado Health Center on Aging and Division of Geriatric Medicine, University of Colorado Health Sciences Center, Denver, Colorado. Editorial assistance was provided by Jeane Nitsch and Susan Joslin, HCFA.

Section 6.6 in this chapter called "Nursing Department Staff Ratios and Quality of Life" was prepared by Rosalie A. Kane, Division of Health Services, Research, Policy and Administration at the University of Minnesota School of Public Health. Under contract with HCFA she directs a study called *Measures, Indicators, and Improvement of Quality of Life in Nursing Homes*. This scope of that study touches on how various aspects of overall staff mix, deployment, training, and role definition relate to the Quality of Life measures under development. Other key investigators associated with the study from the University of Minnesota include Robert L. Kane, Katherine Giles, Leslie Grant, Sandra Potthoff and Lois Cutler. Also among the investigators are M. Powell Lawton from the Philadelphia Geriatric Center and Howard Degenholtz from the University of Pittsburgh. Mary Pratt serves as the HCFA project officer. The Section was written on request from HCFA as a free-standing preliminary comment, reflecting on some issues related to quality of life that might impinge on recommended staffing ratios in nursing departments. The section was prepared without review of any of the other materials in the report. The investigators emphasize that as yet they have no findings from the study, *Measures, Indicators, and Improvement of Quality of Life in Nursing Homes*, and that their comments are based on review of a large literature on quality of life and a very scanty literature on how staff effects quality of life and early fieldwork in 40 nursing homes where they are developing indicators.

addressed to quality problems which come under the rubric of quality of care rather than quality of life.

Accordingly, this chapter has four objectives, to: 1) critically review selected research on nurse staffing and resident outcomes; 2) present background information on the Hartford meeting and discuss their findings and recommendations; 3) discuss other non-ratio aspects of staffing that are not analyzed in this Report; 4) review evidence on the relationship between staffing and quality of life.

6.2 Review of Selected Research on Nurse Staffing and Quality of Care Literature

6.2.1 Introduction

As we have seen, recent official reports by government agencies of serious problems in nursing homes of malnutrition, dehydration, pressure sores, abuse and neglect, coupled with a continuous flow of newspaper and television coverage, have led many to accept the position of the consumer advocacy organizations that inadequate staffing is the root cause of the identified problems. Second, it seems a matter of simple logic, faulty as we shall see, that more staffing must result in better resident care. It certainly seems counter intuitive that reductions in nurse staffing to very low levels would not result in quality problems; hence, the need for minimum standards. And, for the consumer advocates, much higher minimums than currently required. Third, there are some research studies which have been cited by a consensus statement of experts as consistently showing “the positive relationship between higher nurse staffing levels, especially RN staff, and the outcome of nursing home care.” We will discuss the consensus statement in the next section.

In this section, we will briefly review *selected* research studies which report on the relationship between nurse staffing and resident outcomes. Our examination of these studies calls into question just how “positive” and how “consistent” the findings were and other study design elements which limit what can be concluded. This does not mean that the studies were not conducted competently and professionally. Every study has limitations and the studies investigators often acknowledged some of our concerns described below. Although we cannot review each cited study here in great detail, the following should be noted in evaluating the strength of the evidence presented.

6.2.2 Sample Size and Representativeness

Some of the studies were conducted with the resident as unit of analysis; others with the nursing home as the unit of analysis. With two exceptions, (Cohen and Spector, 1996; Harrington, et al, 1999) the data analyzed in each of the cited studies was limited to residents and facilities from a single State, and usually from a States with a small number of facilities. Cherry (1991) analyzed 1984 data of 134 Missouri nursing homes; Nyman analyzed 1984 data from 247 Iowa nursing homes; Aaronson et al. (1991) analyzed data from 449 Pennsylvania nursing homes; Spector and Takada (1991) analyzed data from 80 nursing homes in Rhode Island; Bliesmer et al. (1998) analyzed data from about 440

nursing homes in Minnesota over a 3-year period from 1988 through 1991; Munroe analyzed 1986 data from a sample of 455 Medicare certified skilled nursing facilities in California. The Munroe study (1990) analyzed data from a large sample of California SNFs. As will be shown below, the individual single State studies are so divergent - different design, data, measures, and research questions - that it is very difficult, really impossible, to aggregate them into a summary conclusion.

There are two studies that are not of single States. Harrington et al. (1999) has employed OSCAR data which reports on all Medicare, Medicaid, and dually certified homes in the United States. Cohen and Spector (1996), the other exception to a single State study, analyzed data from a nationally representative sample of 658 Medicaid-only homes from the Institutional Population Component of the National Medical Expenditure Survey (NMES), 1987.

The data for all the studies cover years prior to the implementation of OBRA '87 in October, 1990, although the Bliesmer et al. study straddles that period. Although we would expect that the relationship between staffing and outcomes to be consistent from year to year, the introduction of a number of changes in care practices as a result of OBRA may have altered that relationship. Whereas many of the cited studies were published after the implementation of OBRA, the data analyzed in all these studies, with the qualification noted above about the Bliesmer study, were from the pre-OBRA period.

6.2.3 Outcome Measures and Risk Adjustment

Two studies, Harrington et al. (1999) and Munroe (1990) have employed number of deficiencies as the sole measure of resident outcomes, a suspect measure. Deficiencies represent discrete problems identified by State surveyors. Even if correctly determined by surveyors, they were never intended or conceptualized to be of equal importance and additive. For example, one nursing home can receive a deficiency for not prominently posting in the facility information on how to apply for and use Medicare and Medicaid benefits and another nursing home can receive a deficiency for placing residents in immediate jeopardy, e.g., failure to protect residents from abuse. HCFA's July, 1995 enforcement regulation recognized the unequal nature of deficiencies. It required a two step process in deficiency determination on the part of surveyors. Every identified problem was to receive a deficiency followed by a second determination of the seriousness of the problem measured on a scope and severity scale.

In addition to the nonadditive nature of deficiencies, Harrington seems to acknowledge that the determination of the deficiency itself is faulty: "...there are known variations in the surveyor procedures and practices for determining deficiencies across the 50 States and the District of Columbia, as well as variance within states". This problem was also highlighted by the GAO and HCFA in prior studies.

The other studies typically employed a very limited array of outcome measures, usually 1 to 3 in number, with adequate to inadequate risk adjustment. Aaronson et al. (1994) used the pressure sore rate and restraint use rate as the outcome measures. The rate of pressure sores, a prevalence measure,

can be viewed as an inadequate measure because it does not distinguish between pressure sores acquired in the facility from those present on admission. A incidence rate is far preferable than a prevalence rate. This difference cannot satisfactory be addressed with risk adjustment, as was found in the analyses conducted for Chapters 9 through 12. All the resident data, including risk factor adjustments, were derived from HCFA's Medicare/Medicaid Automated Certification System (MMACS) data, a precursor of OSCAR, a data source for which we have no independent confirmation of its accuracy and good reason to think it grossly inaccurate (see discussion below). Further, their long term case mix index, also derived from MMACS data, employs nursing weights derived from over 25-year old studies of William Thoms, weights that are even more questionable as detailed in Chapter 13. Cherry (1991) also employs a composite measure derived from survey data which also appears to be a precursor of OSCAR.

Bliesmer et al. (1998) used as outcome measures functional ability, discharge home, and death one or more years after admission, controlling for residents' age and previous functional ability. The investigators acknowledged the data limitations, particularly the annual data collection, which "... cannot separate the effect of benefits from more active professional nursing that occurs immediately after admission from those that occur later in the patients' course." Spector and Takado (1991) also recognized the limitations in their data for evaluating the impact on short-stay residents. Their outcomes measures consisted of the probability of dying, declining or improvement in functional status over a 6-month period.

Nyman (1988) used several outcome quality measures, including plant maintenance, room maintenance, room furnishings, care plan, diet plan, medication plan, resident care, and quality of life. Plant maintenance, room maintenance, and room furnishing would not be recognized by most observers as *resident* outcome measures. The care plan, diet plan, and medication plan would also be considered by most as process rather than outcome measures, although it can be argued that they would be strongly related to quality outcome measures. The quality of life measure is derived from a random sample of ten residents and their response to a number of questions which are summed into a five point satisfaction score. As will be shown later in this chapter, quality of life is a very nuanced concept and particularly difficult to measure. Without more information, this crude measure is suspect. The last outcome measure, one the author himself noted problems with, included resident care and measured the average number of patients who had clean clothing, were fully dressed, had clean hair, clean eyes, clean ears, daily oral hygiene, managed facial hair, clean and trimmed toenails, clean skin, good skin turgor, and fresh water available. As noted by Nyman, "the data regarding this variable, however, were ambiguous since some of the care categories may not have been applicable to all patients..."

Cohen and Spector (1996) used as outcome measures mortality within a year, having a bed sore (a prevalence measure with the attendant problem noted above), and Activities of Daily Living (ADL) status at the end of the study year. Both the ADL status measure and particularly the mortality measure are limited as measures of nursing home quality and the potential impact of nurse staffing. This is

because the design of the study in measuring the outcomes counts their occurrence outside the nursing home which muddles their interpretation. If a former resident dies within the study year outside the nursing home, it is difficult to interpret this outcome as due to care received in the nursing home as opposed to care received in the hospital or from other non-nursing home care. Spector in another article (Spector and Mukamel, 1998) appears to acknowledge this difficulty when they note that “outcomes may be influenced by event after discharge for which the facility should not be held accountable (p. 300).” Further, Cohen and Spector themselves caution that “it is important to keep in mind that this study was limited to a few important outcomes. Because quality is multi-dimensional, analyses using a comprehensive set of outcome measures would be necessary to fully understand the relationship of reimbursement and staffing intensity to quality as measured by resident outcomes.”

6.2.4 Measurement of Staffing

Any study of the relationship between staffing and resident outcomes requires reasonably accurate measures of the various categories of nurse staffing, (i.e., Registered Nurse (RN), Licensed Practical Nurse (LPN), and Nurse Aide (NA)). At first glance, this might seem nothing more than simply counting people. However, nursing homes provide nursing staff 24 hours per day, different staff are on different shifts, often for different lengths of time, staff call in sick or on some kind of leave, and nursing homes often make use of temporary and sometimes extended use of contract nurses through outside agencies. Converting all the various times of nursing staff to total hours per resident day over some defined reporting period is more difficult than it might appear, particularly if the reporting period is not coterminous with the record keeping as seems to be the case for payroll records for regular staff and invoice records for contracted staff. In addition as noted in Chapter 6, the central independent variable(s) of staffing (RN, LPN, NA) per resident day also requires a resident count. Although this is a lot easier than counting staff, there is some variability in how this is typically measured - some count the residents in the facility at one point in time, others use average daily census over some period of time, and there are differences of whether people not in the facility but in the hospital are entered into the count.

Given the above, *it is surprising that not one of the studies reviewed offered any assessment or even consideration of the accuracy of the staffing data employed in their analysis.* Most of the studies explicitly employed MMACS, a precursor of HCFA’s OSCAR system, which has been known to users to have a number of duplicate facilities and other major editing problems, as compared to OSCAR. Other studies appear to use MMACS or some other staffing data source which are generated by State Survey Agencies in the pre-survey period. And the OSCAR data themselves, while more accurate than MMACS, is very inaccurate particularly with respect to reported nurse aide time, as presented in a separate validity analysis in Chapter 7. Cohen and Spector used as a data source for staffing the Institutional Population Component (IPC) of the 1987 National Medical Expenditure Survey (NMES), the precursor of the 1996 Medical Expenditure Panel Survey (MEPS). As discussed in Chapter 3, all these data of nurse staffing are essentially self-reports by the facility with little to no

editing and no independent validation or assessment. As such, their accuracy is suspect.

Some studies appear to employ Medicaid Cost Report data or other financial and operational data reported to a State Agency, presumably the rate-setting agency. As such, they should be more accurate because they are presumably desk audited, and potentially vulnerable to a real audit and sanctions for misreporting of data. Of course, since these data are used for reimbursement, there may be for some cost-based reimbursement systems counter incentives for exaggerating staffing levels. The analyses presented in Chapter 8 found nurse staffing as reported Ohio Medicaid cost reports to be reasonably accurate, particularly with respect to reported RN and LPN staffing and far more accurate than OSCAR data.

The key point here is that *none* of the reviewed studies offered any evidence or even consideration as to the accuracy of the reported staffing measures employed in the various analyses. And there is evidence presented in Chapter 7 and Chapter 8 that renders the reported data sources in the cited studies suspect. Finally, the use of some covariates in many of the regression analyses compounds this problem of staffing accuracy. In contrast to the analyses reported conducted in this study and reported in subsequent chapters, these regression often entered into the equations covariates that are known to be highly associated with nurse staffing such as profit/non-profit or hospital-based/freestanding status. These particular covariates are likely to weaken any association between staffing and quality by using a proxy for staffing in the model.

6.2.5 Consistency and Strength of Findings

Apart from all the above noted limitations in the research cited in support of the Hartford findings, it is important to examine the findings themselves. As noted above, the studies typically attempted to examine the impact of nurse staffing on one to three outcome measures. The three studies with particularly suspect outcome measures found fairly weak results. Munroe (1990) found RN hours and LVN (licensed vocational nurse) hours had no impact on deficiencies; the ratio of RN to LVN hours per resident day had a significant negative relationship with number of deficiencies. However, this relationship was significant at $p < .10$ level in a regression analysis that only explained about 9% of the variance. Similarly, Harrington (1999) found a highly significant ($p < .01$) negative relationship between nursing care staff and total care deficiencies. However, it is not surprising that the large $N=13,700$ produces such a reasonably high significance level; the regression model only explained about 12.5% of the variance. Nyman found a combined measure of nursing hours to be significantly and positively related to three of his eight outcome measures. Two of these three measures, plant maintenance and room furnishings, cannot be viewed as resident outcome measures, as noted above. The third measure, quality of life, is of dubious value, again noted above. No significant relationship was found for the three process measures.

Cherry (1991) found a significantly negative relationship between RN hours per resident day and a

composite measure of poor care. However, the regression model only explained 12% of the variance. No significant relationship was found for LPN and Aide hours per resident day and poor care. Aaronson et al. (1994) found a significantly ($p < .10$) negative relationship between direct care (nursing) staff per 100 beds and the pressure sore rate; no significant relationship was found for restraint use rate even if at the higher significance threshold of .10. Bliesmer et al. (1998) essentially found highly significant positive and negative relationships ($p < .001$) for licensed nursing hours and the probability of discharge home and death, respectively, in the final year for each study cohort. No significant relationship was typically found for nonlicensed nursing hours. Licensed, but not nonlicensed, nursing hours were significantly associated with less dependency of residents three years later. However, “this effect appears to be primarily due to the likelihood of discharge home or remaining alive. When only the chronic residents are studied, the role of professional nursing hours virtually disappears.”

Spector and Takada (1991) did not find any significant impact of staffing and high ADLs on death and functional decline. However, moderate staff/high ADL and low staff/high ADL were significantly associated with between 30% and 40% less likely to improve compared to high facilities with high staff and high ADLs. Cohen and Spector (1996) found that a higher RN intensity (ratio) “...was associated with a lower rate of mortality”. The investigators acknowledge that the effect is small. A higher intensity of LPN staffing was found to “...significantly improve functional outcomes, although this impact is also relatively small.” There appeared to be no impact of staffing on having a bedsore. In contrast, Aaronson et al. (1994) found a significant negative relationship, as noted above.

6.2.6 Conclusion: Review of Selected Research on Nurse Staffing and Quality of Care Literature

6.2.6.1 Is There a Positive Association Between Staffing and Quality of Care Outcomes?

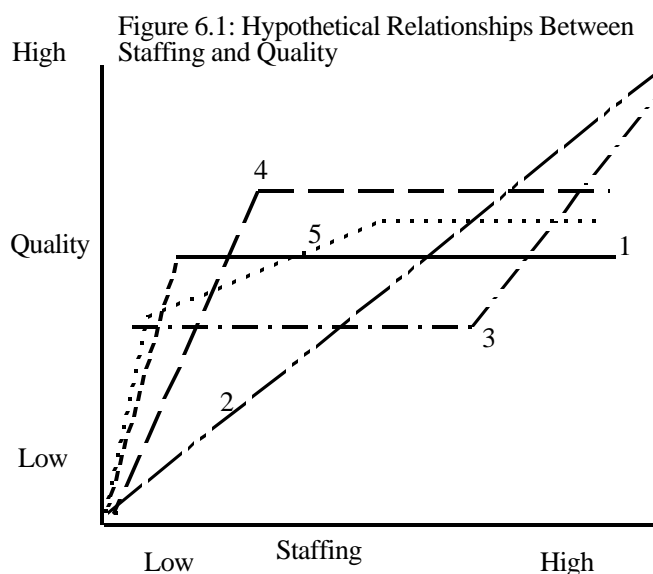
Any conclusion on the association between staffing and outcomes derived from the above studies would be based on small samples of limited representativeness, questionable outcome measures and risk adjustments, staffing measures of unknown accuracy, and findings that show no or very weak relationships between staffing and outcomes. We find no way to conclude on the basis of these reviewed studies that there is a strong and consistently positive association between staffing and quality of care outcomes.

However, it should also be acknowledged that none of the studies has found a significant negative relationship between staffing and quality. As such, this pattern suggests that better designed studies might produce the strong evidence claimed by the Hartford statement, but not found in our scrutiny of their evidence. This is not to suggest that the reviewed research was not professionally conducted. Many of the studies were limited by the data available to the investigators, as discussed above. Also,

many of the studies were not primarily designed to investigate the impact of staffing on outcomes; often this was a secondary objective or a by-product of another analysis, (e.g., to evaluate the impact of Ombudsmen programs, reimbursement, or whether for-profit and not-for-profit homes behave differently). Hence, there is a need for a comprehensive study specifically designed to address the problems identified in the above studies and provide a more definitive assessment of the relationship between staffing and quality problems. It is just such a study that has been conducted for this Report and is presented in the following chapters.

6.2.6.2 Staffing Thresholds

Even if the above evidence on the association between staffing and quality had been stronger and more consistent, *none of the reviewed studies were even designed to identify a critical ratio of nurses to residents below which nursing home residents are at substantially increased risk of quality problems.*² Relevant evidence with respect to specific ratios can only be generated from research designed to answer that question, as will be found in the analyses presented in subsequent chapters. As noted in Chapter 1, this question of specific ratios depends on an analysis of staffing thresholds and it is instructive to hypothesize about the possible relationships. These hypothetical relationships between



nurse staffing and quality problems can be found in Lines 1 through 5 below. It should be noted that these relationships, as depicted by the five lines in Figure 6.1, are crudely drawn with straight lines for emphasis; the relationships revealed in actual data would be less pronounced.

² It is true that the Spector and Takada (1991) did conduct an analysis that differentiated between the impact of high, moderate and low staffing (see Table 4). However, we did not see any reporting of the cut points between these levels; hence, no specific thresholds were identified.

Line # 1 in the Figure illustrates the hypothetical relationship of no relationship between staffing and quality problems. Although the link between low staffing levels and quality problems may seem intuitively obvious, there is no necessary connection. Of course, we know that if all the nursing staff were removed, residents would not miraculously return to good health and functioning. Clearly, at *some* ratio of nurse staffing substantially increased levels of quality problems would occur. But there is no apriori reason, apart from empirical evidence, to assume that any or a substantial portion of nursing homes actually staff at these critically low levels. This hypothetical possibility is illustrated in Line # 1. For the entire range of staffing actually found in nursing homes as represented by the solid horizontal line, there is no relationship. Hence, under these circumstances, a study would report no association. Actual data might report a few homes that would lie in the broken line range, but they would be too few in number to impact the correlation. But *if* nursing homes were to staff below a very low threshold (between zero and very low), then quality would rapidly deteriorate as depicted by the broken line. Further, this is more than a theoretical possibility. As we have seen in Chapter 3, nursing homes may reduce their staffing levels in response to financial difficulties or labor shortages.

Line # 2 illustrates a hypothetical relationship expected by many observers. We see a strong positive relationship between staffing and quality of care over the entire range of staffing.

Under these circumstance, a requirement of a minimum staffing ratio established at any level would result in an improvement in quality. A fixed increase in the minimum would result in a fixed improvement in quality.

Line # 3 illustrates another hypothetical positive relationship between staffing and quality of care. Here we see for staffing at all but the highest levels, no relationship between staffing and quality of care, although quality of care is below average. However, when staffing levels are at a very high level, a threshold is reached and quality of care sharply improves. Hence, minimum staffing requirements established anywhere below this high threshold would not result in any improvement in quality of care.

Line # 4 illustrates another hypothetical positive relationship between staffing and quality. Here we see for staffing at all but the lowest levels, no relationship between staffing and quality of care, although quality of care is above average. However, when staffing levels reach a low level, quality of care sharply deteriorates. Hence, minimum staffing requirements established anywhere above this low threshold would not improve quality of facilities that normally staff above this low threshold.

Line # 5 illustrates still another hypothetical positive relationship between staffing and quality. Here we see two inflection points or thresholds. At moderate to high staffing levels there is no relationship between staffing and quality of care, although quality of care is above average. However, as staffing declines from moderate to low levels, quality of care deteriorate. And as staffing further declines from low to very low, quality of care deteriorates even more sharply. Under these circumstances, a minimum staffing requirement established anywhere below moderate levels would not improve quality of care for

facilities that staff above average levels. A minimum staffing requirement established at the first inflection point of very low staffing would result in quality improvement for the relatively few nursing homes that staff below this threshold. Similarly, a minimum staffing requirement established at the second inflection point of low (as opposed to very low) staffing would result in additional but somewhat less quality of care improvements.

These hypothetical relationships illustrate something extremely important. Actual data arrayed as illustrated in Lines 2 through 5 *would all produce a positive association between staffing levels and quality of care. Yet, they all reveal different inflection points or threshold relationships, and they would lend support to very different minimum staffing recommendations.* As we have seen, none of the reviewed research indicated thresholds, nor were they even designed to determine the potential existence of these thresholds. To support specific ratio requirements, research needs to be designed with the objective of identifying potential thresholds or inflection points in the relationships between staffing and quality of care problems. As will be discussed below, it is also important that possible recommendations for staffing ratios be based on an analysis of the relationship between staffing and quality that adjusts for case mix. The analyses presented in Chapter 9 through 12 are designed with that objective. Of course, in considering different potential thresholds for establishing a higher minimum staffing requirement, it would be necessary to balance the benefits of further improvements in quality of care with the costs of these improvements.

6.3 Hartford Institute for Geriatric Nursing--Nursing Home Staffing Conference

6.3.1 Background

An invitational, one day conference was convened by the John A. Hartford Institute for Geriatric Nursing, Division of Nursing, New York University on April 14, 1998, to develop a research agenda and strategies for studying staffing and quality of care in nursing facilities. Funding for the conference (entitled, “Staffing, Case Mix, and Quality in Nursing Homes”) was provided by the Agency for Health Care Policy Research (now known as the Agency for Healthcare Research and Quality). Approximately 30 national experts attended--leading nurse researchers, educators and administrators in long term care, consumer advocates, health economists, and health services researchers with expertise in nursing home staffing and reimbursement issues.

A major purpose of the conference was to identify priority areas for research regarding the relationship between staffing and quality taking into consideration resident case mix. Conference objectives included small group discussion to address education and training of professional staff; staffing in long term care facilities; and staffing in sub-acute and special care units. Discussion addressed consideration of the level of nurse staffing in U.S. nursing homes and minimum nurse staffing level in nursing homes by different types of staff (i.e., RNs, LVN/LPNs, and NAs). Discussion was launched incorporating published literature, information provided by three conference speakers, clinical experience, existing

staffing standards benchmarks, Federal data, and ongoing nursing home staffing research. The conference concluded with expert input regarding impacts on and constraints to nurse staffing. Products generated as a result of the conference included: a statement of research priorities, an agreement among some conference attendees about minimum staffing levels, and two journal articles.

6.3.2 Conference Proceedings

The expert panel reviewed examples of some of the published literature and ongoing nursing home staffing research including: 1) previous studies on staffing and quality of care; 2) current nurse staffing levels for all nursing home in the U.S. from the Federal On-Line Survey Certification and Reporting System (OSCAR); 3) the Health Care Financing Administration's (HCFA) 1995 and 1997 nursing home staff time measurement studies (from the perspective of adjusting staff time for resident acuity); and 4) the October 1995 National Citizens Coalition for Nursing Home Reform (NCCNHR) position paper, "Consumers' Minimum Standards for Nurse Staffing in Nursing Homes" (which was in the process of being updated). The 1996 Institute of Medicine report entitled, Nurse Staffing Hospitals and Nursing Homes: Is It Adequate?, was also discussed indirectly as it related to research and also was reflected in NCCNHR's activities to update their position paper.

As background, three presentations were made at the start of the conference. The first presentation addressed quality in nursing homes relative to current knowledge regarding nursing home processes and outcomes. The second was an update on the current state of science in nursing homes, presenting organizational and clinical models of staffing and their relationship to quality. The third presentation pertained to case mix in nursing homes and the extent to which the resident case mix measures can be incorporated into the process of assessing staffing needs.

Three work groups were convened to identify research priorities. The work groups were organized around a key staffing concept area. Panel experts in each work group were asked to explore the concept area using the research and policy questions posed by the Hartford Institute to guide their discussions.

6.3.2.1 Work Group One: Education and Training of Professional Staff

Work Group One was given the task of evaluating education and training of nursing home professional staff. The work group formulated key research questions and from those questions developed key research priorities. Key questions included: What criteria should be used to judge staffing quality? What educational preparation, training, and credentials are necessary for professional staff in nursing homes? What experiences are relevant? How can we assure that this preparation is achieved? What should the regulatory standards be?

Key research priorities and discussion that evolved from these questions were:

- C Staff quality is often judged on education and expertise. Furthermore, the quality of staff could be judged in terms of value the staff represents to different stakeholders (e.g., customers, nursing profession);
- C Specifically in terms of education, there is a lack of clear documentation on basic nursing education and there is a need for training in gerontology, supervision, and leadership;
- C There was consensus among the group that staffing gold standards do exist if one pursues two certifications simultaneously: one, American Nurses Association's certification in gerontological nursing and two, facility certification of their own nursing home medical directors. The work group members also explored the idea of a comparable certification process for the Director of Nurses (DON) in the gerontology area.

6.3.2.2 Work Group Two: Staffing in Long Term Care Facilities

Work Group Two was given the task of evaluating staffing in long term care facilities. The work group formulated key research questions and from those questions developed key research priorities. The key questions included: How should the staffing mix differ for long term care, sub-acute, and special care units? How should these staffing levels vary to meet different resident (case mix) needs? What types of staffing models are successful and what types are inadequate? Are there norms already in practice for different approaches? What criteria, including process and outcomes, should be used to judge staffing? What minimum staffing standards should be set by HCFA?

Key research priorities and discussion generated by the second group's discussion included:

- C There is a need to differentiate between 'recommended' versus 'ideal' facility staffing--the group recommended a 24 hour/day RN services;
- C Reflections regarding day shift adult nurse practitioner (ANP)/geriatric nurse practitioner (GNP) staffing levels that adjust for intensity and case mix;
- C Consensus regarding a 1:2-3 feeding ratio;
- C Consensus that current federal minimal standards are too low;
- C Issues regarding low wages for NAs being indirectly associated with the NAs ability to successfully do the job;
- C There is a need for understanding case mix and resident case mix flow as it relates to staffing issues and the need to understand the meaning of >basic= nursing service;

- C Issues related to replacing staff when people call in sick recognizing that a large number of nursing homes do not replace staff who call in sick;
- C Considerations regarding the size of the institution vis-a-vis inflexible nurse staffing standards that do not account for number of residents. The intensity of care varies on any given day and varies with the number of residents. Thus, the roles and responsibilities change correspondingly on any given day.

6.3.2.3 Work Group Three: Staffing in Rehabilitation and Sub-Acute Units

Work Group Three was given the task of evaluating the staffing in Rehabilitation and Sub-Acute Units. The key questions the group developed were similar to those posed by the second work group (Staffing In Long Term Care Facilities).

Key research priorities and discussion evolving from the third group's discussion included:

- C The demand for staffing is not linear across a resident's stay (e.g., a resident's need for staffing intensity changes during their length of stay--generally it is highest in the beginning and at the end of the nursing home stay);
- C RN staffing needs to be both front and back loaded in terms of a resident's stay and RN staff is required 24 hours a day;
- C The RN is necessary to assure access to other levels of care;
- C Aide staffing is relatively high at the beginning of an admission, but as a resident progresses, may be reduced. LPN time is variable;
- C Subacute staffing requires higher RN time than rehabilitation staffing, with higher aide time and similar levels of care from other staff;
- C LPN care is less important because resident needs access to either an MD or someone who can assess and/or start therapy;
- C Issues of case management were also discussed. Case management is part of the RN's role and is part of the reason staffing is front and back loaded.

Research priority staffing issues that all work groups addressed included identifying the main gaps for answering the questions -- what mix of nursing staff is associated with the highest quality of care? Also discussed were aspects of staffing that make a difference, staffing priorities, and identifying a nursing

home chain or network that would be willing to allow onsite data collection and research aimed at improving quality of care.

The work groups re-convened to present their findings to conference attendees and reach consensus on the research priorities formulated during small group discussions. The concept areas and research priorities were refined and further delineated through efforts by the hosting Hartford Institute staff. A statement of research priorities, a draft statement regarding nurse staffing recommendations, and two articles were produced based on the expert panel's input.

6.3.3 Conference Findings

After reviewing the data on staffing from a number of sources and discussing critical staffing issues among work group members, the experts at the conference made two (among other) research priority recommendations about nurse staffing. First, the Hartford statement concluded that the current average nurse staffing levels in nursing homes in the U.S. appear inadequate. Further research identifying variation in resident acuity, nursing home type, and staffing shift is necessary to accurately specify staffing levels. Second, some experts concluded that current federal minimum staffing regulations for nurses appear low, and recommendations regarding specific minimum nurse staffing standards were addressed by the expert members.

To this end, in August 1998, the Hartford Institute of Geriatric Nursing forwarded a staffing recommendation to conference participants asking for feedback. During this same time, Charlene Harrington, Ph.D., RN (UCSF) addressed the Institute of Medicine Committee on the Quality of Long Term Care regarding the need for staffing standards, and indicated that the conference experts were preparing a recommendation to raise minimum staffing standards. The first draft of the minimum staffing standards, developed by staff, was revised based on feedback from some conference participants (although all participants were given the opportunity to suggest changes, not all participants responded). The revised staffing standards were disseminated among all conference participants, seeking endorsement by October 1998. Comments on the revised standards were also encouraged. The final staffing standards, along with the list of endorsers, was submitted to Peter Kohler, the IOM Committee chair on Long-Term Care Quality in November 1998; by Mathy Mezey, Director of the Hartford Institute for Geriatric Nursing at NYU; and Christine Kovner, also of NYU. A similar submission was planned for the Senate Committee on Aging and the Health Care Financing Administration, who were both considering whether recommendations should be made to improve nursing home staffing standards.

A draft paper was developed by key conference leaders based on the conference discussions. Two articles were also produced based on conference proceedings. This first of two articles focused on the secondary theme of the conference--nursing home staffing recommendations. While the Agency for Health Care Policy and Research (AHCPR) provided funding for the conference, it is duly noted that

AHCPR did not officially endorse a position regarding nursing home staffing recommendations. The second article, produced at a later date, more appropriately conveyed AHCPR's focus for the conference--identification of nursing home staffing research priorities.

The first paper, "Experts Recommend Minimum Nurse Staffing Standards for Nursing Facilities in the U.S.," was accepted for publication by the *Gerontologist* (February 2000, Vol. 40 (1)). The list of authors include Charlene Harrington, Ph.D., RN, University of California at San Francisco; Christine Kovner, Ph.D., New York University; Mathy Mezey, Ph.D., Hartford Institute for Geriatric Nursing; Jeanie Kayser-Jones, Ph.D., UCSF; Sarah Burger, RN, National Citizens= Coalition for Nursing Home Reform; Martha Mohler, RN, National Committee to Preserve Social Security and Medicare; Robert Burke, Ph.D., Muse and Associates; and David Zimmerman, Ph.D., University of Wisconsin-Madison. Following is the Executive Summary from that paper:

To address the issue of staffing and quality of care in nursing facilities, experts were convened from across the country. Using nursing home staffing data from Health Care Financing Administration and recent staff time studies, the experts concluded overwhelmingly that the average staffing levels in nursing homes are too low to provide high quality of care. The experts recommended minimum staffing standards for nursing administration, 24-hour RN supervision, additional education and training, direct care giver ratios (1 nurse to 5 residents on days, 1:10 on evenings, and 1:15 on nights and additional staff at mealtime), and licensed nurse ratios (1:15 on days, 1:20 on evenings, and 1:30 on nights). The total recommended time is 273 minutes (4.55 hours) per resident day compared with 210 minutes (3.51 hours) on the OSCAR data and 250 minutes (4.17 hours) for the HCFA time studies with adjustments upward to take into account resident case mix. The minimum standards are recommended to state legislators, Congress, and HCFA for new legislation.

Seventeen out of the 30 conference participants endorsed the final staffing recommendations generated as a result of the conference proceedings. Three types of conference groups did not endorse the nurse staffing recommendations. The first group (seven people) was comprised of government officials, government contractors, or individuals on commissions who felt unable to take a position due to potential conflict of interest. The second group (three people) either did not respond or did not feel they had the expertise to make a judgement. The last group (three people) did not support the proposal. Of these three people, two nursing home administrators were concerned about the government's ability to fund the staffing level as well as the available labor pool to implement the staffing recommendation and one economist was concerned about the cost effectiveness of increasing the staffing level in nursing homes.

The second article, identifying research priorities, was also produced based on conference proceedings. The article, "Research Priorities for Staffing, Case Mix and Quality of Care in U.S. Nursing Homes,"

was accepted for publication in *IMAGE: The Journal of Nursing Scholarship* (forthcoming 2000).
Article authors were Christine Kovner, Mathy Mezey, and Charlene Harrington.

6.4 Hartford Statement: Guide for Research

6.4.1 Limitations

As might have been inferred from the above discussion, it would be difficult to reconcile our review of selected research on the relationship between nurse staffing and resident outcomes with the Hartford statement's findings and recommendations as published in *The Gerontologist*. The same studies we reviewed here are cited in the *Gerontologist* article as consistently showing "the positive relationship between higher nurse staffing levels, especially RN staff, and the outcome of nursing home care." But our examination of the cited studies calls into question how "positive" and how "consistent" the findings were, and other study design elements which limit what can be concluded from these studies. Perhaps more importantly, as noted above, even if the above evidence on the association between staffing and quality of care had been stronger and more consistent, none of the reviewed studies were even designed to identify a critical ratio of nurses to residents below which nursing home residents are at substantially increased risk of quality of care problems. A positive association is consistent with many different critical thresholds (in the case of a positive linear relationship) for establishing minimum ratio requirements.

In spite of our review of the Hartford proceedings, it is not clear to us how they arrived at their recommendations. Normally expert panels are established to follow highly structured protocols in reviewing published research for the purpose of making recommendations. This is the normal procedure followed by AHCPR in developing their practice guidelines. It is also the procedure described by Jack Schnelle in Chapter 14 with respect to a RAND, Inc. project to develop quality indicators. As we have seen, our review of the research differs from the assessment reported in the *Gerontologist*. Alternatively, an expert panel is sometimes convened to render a consensus judgement, sometimes employed a Delphi technique, on a critical problem because of an absence of published research on the topic. Expert panelists render a judgement based on their general knowledge and experience. Again, we are unclear as to what procedure was followed in arriving at the consensus statement. It is also important to note, that only a bare majority endorsed the recommendations. The majority statement also said that a majority of those who did not endorse the statement were not explicitly opposed.

6.4.2 Guide for Research

Although we are unclear as to how the Hartford participants arrived at their recommendations, the statement identified a number of other aspects of staffing that would eventually have to be address in any consideration of a minimum staffing ratio. These include recommendations with respect to education and training, use of nurse practitioners, allocation of staff between shifts, and allocation of staff between administrative and direct care activities. In addition to the studies reviewed above on the relationship between staffing and resident outcomes, the Hartford statement cited other relevant

research (See Chapter 5 results of focus group interviews with NAs for supporting evidence.):

Inadequate food intake is a major determinant of mortality in the frail elderly in nursing homes (Blaum et al., Frisoni et al., 1995). Other studies have reported that inadequate staffing and inadequately trained staff are major contributors to poor feeding of residents, inadequate nutritional intake, undiagnosed dysphagia, poor oral health, resident deterioration, hospitalization, malnutrition, dehydration, and starvation (Amella 1999; Kayser-Jones, 1996, 1997; Kayser-Jones and Schell, 1997.)

Other studies (Bowers and Becker, 1992; Foner, 1994) reported that NAs (Nursing Assistants) cut corners to manage workloads and lack time to provide high quality, individualized care given the requirements for institutional efficiency and the high work volume.

In a prior Report to Congress (HCFA, 1998), we advanced a similar but more nuanced position. The argument essentially links malnutrition of nursing home residents to inadequate staffing:

In recent testimony before the U.S. Senate Special Committee on Aging, evidence from various studies was cited that “between one-quarter and one-third of all nursing home residents have a low Body Mass Index, while between 10% and 14% experience significant weight loss.”³ Similar findings were found for these nutritional markers in the University of Colorado study described above.⁴ While investigators were cautious in interpreting these nutritional markers as necessarily avoidable or treatable, especially for residents suffering from long-standing and profound chronic illnesses, clearly too much of this malnutrition is “. . . caused or exacerbated by poor care practices . . .” such as facility failure to provide nutritional supplementation in underweight residents or adequate assistance with eating. Although evidence was presented in the Senate testimony that these nutritional problems had not improved under the new survey, deficiencies for Menus and Nutritional Adequacy (F363) have declined from 15% of facilities being given deficiency citations in 1991 to just over 5% in the last 6 months of 1995⁵ to under 5% for 1996.⁶ While it is true that deficiency citations have declined in other areas as well, the decline of deficiencies in this specific area of nutrition does not appear justified by any decline in

³ Statement by Catherine Hawes, Ph.D., Director of Program on Aging and Long Term Care, Research Triangle Institute, for U.S. Senate Special Committee on Aging, October 22, 1997.

⁴ “Recent Data Relating to Nutritional Status,” private communication from Andrew Kramer, M.D., to Marvin Feuerberg, Ph.D., November 6, 1997.

⁵ Harrington, C. et. al., *Nursing Facilities, Staffing, Residents, and Facility Deficiencies, 1991 Through 1995*, Table 52, Department of Social and Behavioral Sciences, University of California, San Francisco, January 1997.

⁶ Cowles, C.M. *Nursing Home Statistical Yearbook, 1996*, Table IV-3, Cowles Research Group.

what many regard as a serious problem. Although the new HCFA initiatives outlined above are intended to address this problem, it is too early to judge their effectiveness.

6.4.2.1 Staffing and Malnutrition of Nursing Home Residents

The above studies utilize MDS and other medical record data to generate outcome indicators of poor nutritional health, such as a low Body Mass Index or significant weight loss. Although the investigators acknowledge that these outcomes for some residents may be unavoidable, they argue that too much of this malnutrition is “caused or exacerbated by poor care practices” such as facility failure to provide nutritional supplementation in underweight residents or adequate assistance with eating. Unfortunately, these outcome studies provide no direct evidence on the extent and nature of these poor care practices. Some direct evidence can be found in a series of recent research articles presenting the findings from a four-year anthropological study that investigated the social, cultural, and clinical factors that influence eating in nursing homes.⁷ The study employed participant observation and in-depth interviews with physicians, nursing staff, and nursing home residents and their families. Also, to study eating problems more directly, very careful observations were made weekly and detailed field notes were recorded at all three meals, seven days a week for 100 residents who were not eating well. The study found many factors, such as poor oral health, undiagnosed swallowing disorders, lack of ethnic foods, and lack of sensitivity to individual needs, as contributing to eating problems. However, “inadequate staffing emerged as the major factor that influenced nutritional care.” Some examples include:

“...because the food carts had to be returned to the kitchen at a specific time, the staff had only 45 minutes to an hour to feed residents. Feeling pressured to finish within the hour, the staff became impatient with those who ate slowly; they spoke to them authoritatively: ‘Open your mouth!’ ‘Don’t talk, eat!’ ‘Laura, keep quiet. Quiet, Laura, you’re eating!’ ...When residents ate too slowly, the staff often mixed the solid food... with the liquids... and residents were forced to ‘drink’ their meal. All of the food - - the entree, the vegetables, and the dessert - - were added to the milk, resulting in an unidentifiable, unpalatable mixture...Sometimes residents were forced to eat rapidly against their wishes: huge spoonfuls of food were placed in their mouths. Some residents choked and coughed as they were fed large amounts of food too quickly....”⁸

Interview data from physicians, families, residents, and the nursing staff themselves all pointed to the

⁷ In addition to the Kayser-Jones article referenced above, see Kayser-Jones, J., “Inadequate Staffing at Mealtime - Implication for Nursing and Health Policy,” *Journal of Gerontological Nursing*, 1977, 23(8): 14-21. Also see Kayser-Jones, J., Schell, E., Porter, C., Paul, S., “Reliability of Percentage Figures Used to Record the Dietary Intake of Nursing Home Residents,” *Nursing Home Medicine*, 1977, 5(3): 69-76.

⁸ Kayser-Jones, J., Schell, E., “The Effect of Staffing on the Quality of Care at Mealtime,” *Nursing Outline*. 1997, 45, p. 68.

inadequate number of staff to assist residents at mealtime. For example, a certified nursing assistant (CNA) noted, “Sometimes some CNAs have five or six feeders [residents who have to be fed] and no help so I try to go down the hall and give people a bite or two. Most of the time if they have a lot of feeders, the patients just don’t eat. There’s no one to feed them so the trays go back, and the people get no food.” The OSCAR data indicate that a considerable number of nursing home residents need assistance with eating. For example, nearly one half (47%) need some assistance. Over one fifth (21%) are totally dependent in eating.⁹ Given this need for eating assistance, it is critically important that the ratio of CNAs, the staff who provide most of the mealtime care, to residents is sufficient. In this study, these ratios were not sufficient. On the day shift in Facility A, the ratio of CNAs to residents was about 1:9 to 1:10. On the evening shift, it was 1:13.5 to 1:15.5. At Facility B, the staff to resident ratio was slightly higher: 1:7.7 on the day shift and 1:11.5 during the evening.”¹⁰ Although Kayser-Jones acknowledges that nursing homes could partially address the eating problems by more “creative planning,” her research emphasizes that “higher staff-to-resident ratios at mealtime are imperative.” Additionally, she maintains that it is also important for CNAs to be supervised by professional nurses and taught how to feed residents with complex eating problems.

6.4.2.2 Summary: Malnutrition and Inadequate Staffing

Essentially, this four-year anthropological study has found that eating problems of nursing homes residents are primarily due to inadequate staff. However, as we noted in the prior report, it is important to not overgeneralize these findings based on intensive observation for only two facilities. What would not be disputed is that there are a number of nutritional outcome measures, based on data by different investigators, indicating nutritional problems. Second, there are independent data sources indicating a relatively high percentage of residents needing assistance with eating and a relatively low CNA to resident ratio to meet this need. However, we have not identified any research analyzing the relationship between measures of nurse staffing to nutritional problems for a sufficiently large sample of nursing homes. This required analysis would have to address all the issues identified above in the Hartford cited research, including the need for appropriate risk adjustment. Although Kayser-Jones qualitative observations are dramatic and compelling, without a quantitative study conducted over more homes, her position that staffing numbers (as well as other aspect of staffing) are an important cause of malnutrition must be regarded as a compelling hypothesis.

6.5 Quality of Care vs. Quality of Life Outcomes

Researchers and HCFA regulations often distinguish between what are referred to as quality of care practices and outcomes (e.g., bathing, toileting, feeding, pressure ulcers, urinary tract infections, etc.)

⁹ Cowles, op cit, Table II-6.

¹⁰ Kayser-Jones, “Inadequate. . .,” op cit., p17.

from the care processes and nursing home environment which enhances residents' dignity; individuality; autonomy/choice; sense of privacy; enjoyment; meaningful activity; relationships; sense of security/order; comfort; spiritual well-being, and functional competence. (See discussion below). With a few debatable exceptions, the outcome studies reviewed in this chapter would fall under the rubric of quality of care. Also, the outcomes analyses conducted for this study and presented in subsequent chapters would be viewed as quality of care outcomes. There are two important qualifications to this characterization, however. One of the outcome measures examined in Chapter 10 refers to change in resisting assistance with ADLs as a way to measure the personal relationship between residents and staff:

Change in resisting assistance with ADLs is a way to measure the personal relationship between residents and staff. According to Bowers and Kayser-Jones (1996 and 1999), patients and nursing staff regard the relationship that develops between a vulnerable adult and her caregiver to be of paramount importance in determining the quality of a resident's life. Residents describe the importance of gentleness, personal engagement, not being rushed and feeling respected. Aides report that they value having time to promote physical comfort, not make residents wait or rush, and share treats or personal stories. We reasoned that over time residents who initially resist assistance with ADLs out of fear or confusion should gradually become more accepting of care if well-trained and supervised staff are available to permit development of personal rapport (see Chapter 10).

The other qualification to characterizing our outcome measures and analyses as solely quality of life is conceptual. Chapter 14 presents an analysis by Jack Schnelle (UCLA) of the time it takes nurse aides to perform a number of "best practices" which would normally be regarded as quality of care activities: need for physical activity, incontinence care, and feeding and dressing assistance. Yet Schnelle argues "that a distinction between quality of care and quality of life is both arbitrary and misleading":

All care processes that met our inclusion criteria (for the study) involve significantly increased personal contact between residents and NH staff. Our literature review documented the extent to which this personal contact exceeds contact under "usual care" conditions for the protocols pertaining to feeding assistance, ADL dressing enhancement, and incontinence management. If one believes that increased social interaction and personal contact between residents and NH staff can improve residents' perceptions of life quality and/or their agitation and mood, then measures of these outcomes should also improve following implementation of the five care protocols that met our inclusion criteria.

Of course there is no necessary contradiction between acknowledging quality of life components inherent in the performance of quality of care processes and yet maintaining that there are other aspects of quality of life that are not captured at all in quality of care measures. Although an analysis of the impact of nurse staffing on these other aspects are beyond the scope of this study, the next section, by

Rosalie Kane, will review research on the relationship between nursing staff ratios and quality of life for nursing home residents. In addition, a description of an on-going study and some preliminary observations will be presented.

6.6 Nursing Department Staff Ratios and Quality of Life

6.6.1 Background

In May 1998, HCFA awarded a contract to the University of Minnesota for a project entitled *Measures, Indicators, and Improvement of Quality of Life (QOL) in Nursing Homes*. The scope of that project includes: specifying domains of quality of life, developing and testing measures of quality of life at the individual level, and developing and testing indicators (that is, characteristics of the facility programs, staff deployment, physical environments, and policies) that are associated with quality of life.

The QOL domains under development in this work are: dignity, individuality, autonomy/choice, sense of privacy, enjoyment, meaningful activity, relationships, sense of security/order, comfort, spiritual well-being, and functional competence. Each quality of life domain is being measured as a resident outcome, but the study also entails identifying and testing potential indicators that might be associated with one or more QOL domains for all or a subset of residents. Table 1 provides definitions of each QOL domain. Note that each domain can be examined in terms of negative outcomes that suggest that QOL is poor on that domain and positive outcomes; for example, boredom is a negative pole of *meaningful activity*, but meaningful activity can also be expressed in positive terms, such as being stimulated, interested, and engaged with daily life.

Table 6.1 Definitions of QOL Domains

Domain	Outcome definition	Implication for indicators
Autonomy	Residents make choices related to their care and their lives and, within limits of their conditions, direct their own lives.	Facility policies, programs, staff practices and physical environments encourage and do not discourage resident choice and self-direction.
Individuality	Residents feel that they are known and understood as individuals, maintain a sense of self, and continuity in their lives.	Facility policies and staff practices encourage individuality. Residents are not depersonalized.
Sense of privacy	Residents have solitude when desired, interact with others in privacy when desired, and preserve confidentiality regarding personal information.	Facility policies, staff practices, and physical environments support ability of residents to experience privacy.
Dignity	Residents feel that their dignity is intact and do not experience what they consider indignities.	Facility policies, programs, staff practices, and physical environments promote dignity.
Enjoyment	Residents experience enjoyment in their daily lives.	Facility policies, programs, staff practices, and physical environments promote resident enjoyment.
Meaningful activity	Residents have interesting things to see and do. They are not bored. Meaningful activity as the high end of functioning includes making a contribution to the well-being of others.	Facility policies, programs, staff practices, and physical environments promote meaningful activity.
Relationships	Residents are engaged with others in relationships, including with family and friends, other residents, and staff.	Facility policies, programs, staff practices, and physical environments promote viable relationships for residents.
Sense of security/order	Residents feel that they are safe and that the rules and norms in the facility are understandable and predictable. Residents are not afraid.	Facility policies, programs, staff practices, and physical environments promote a sense of security and order.
Comfort	Residents are free from pain and other physical discomforts and their discomforts are noticed and addressed.	Facility policies, programs, staff practices, and physical environments promote physical comfort.
Spiritual well-being	Residents perceive that their lives are worthwhile and meaningful and, when applicable, they take strength and comfort from their religion.	Facility policies, programs, staff practices, and physical environments promote spiritual well-being.

Functional competence.	Within the limitations of their disability, residents are as independent and care for themselves as much as they wish.	Facility policies, programs, staff practices, and physical environments promote resident independence and self-care.
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The Wave 1 test of the Quality of Life measures began in January 2000. The plan is to collect data on quality of life outcomes for 2000 residents (50 residents in each of 40 facilities located in five States). As of April 1, 2000, data collection was complete on 1200 residents located in eight Minnesota facilities, eight Florida facilities, and eight California facilities. All Wave 1 data collection on the QOL of 2000 residents should be complete by mid-June 2000. Four potential sources of data are being used to measure resident quality of life: a resident interview, structured observations of the resident, a family questionnaire, and an interview with a line staff member about each resident.

To construct indicators, the investigators are collecting structure and process information from each facility on candidate indicators that may be associated with one or more quality of life outcomes for residents. After the Wave 1 analyses, those items that show a correlation with facility overall quality of life scores, or with quality of life scores for a subset of residents (e.g. residents with dementia, cognitively intact residents, long-stay residents, short-stay residents) will be used to help select a new group of facilities in which to administer streamlines quality of life measures in Wave 2 of data collection.

Numerous items regarding nursing department staff and other staff are being collected as candidate indicators that may be associated with QOL. Unfortunately, the investigators are not in a position to provide even preliminary results on how staff ratios affect quality of life at the time this Report was completed. Rather, this discussion is divided into the following sections: 1) a discussion of the literature on how nursing staff ratios affect quality of life; 2) a discussion of other aspects of staffing besides nursing staff-to-resident ratios that might conceptually be expected to affect quality of life; and 3) description of how our study of QOL might add to understanding on these points.

6.6.2 Literature Review and Conceptual Discussion

In preparation for refining the research design, the investigators conducted an extensive review of factors associated with the various domains of QOL under study. Unfortunately, this review yields little hard evidence on how nurse staff ratios relate to QOL. In some ways this is not surprising. QOL is a complex concept, which can be hypothesized to be related to many aspects of a facility's programs, policies, staff characteristics, and physical environments as experienced by a particular resident. To the extent that staff characteristics are important predictors of one or more of the postulated QOL domains, sheer numbers of staff in nursing are unlikely to be the determinants. Beyond numbers is the question of what staff actually do, how well they do it, how their roles and tasks are defined, whether they are present in sufficient numbers on weekends and evenings, whether their jobs are structured so that they have the opportunity to know residents as people, and whether and how they are expected to respond

to resident's requests and wishes. Also relevant are the types, roles, and behavior of other staff present, since nursing department members are not the only ones who can affect QOL outcomes. Of course, members of nursing departments comprise the vast majority of staff at most nursing homes, so that absolute numbers of staff can readily be confounded with absolute numbers of nursing staff. Certainly some absolute number of staff members is necessary to create the conditions for both QOL and quality of care in nursing homes. In their elaborate research on the psychosocial quality of nursing home work, Brannon, Streit and Smyer (1992) identified more than 3300 tasks performed by nursing assistants in four nursing homes, and classified these tasks by complexity and the extent to which each task was oriented to the resident. They found that many tasks have little to do with direct care, and even when the tasks were direct-care-oriented they rarely involved interacting with residents. Yet other work in the literature, briefly reviewed below, suggest that the frequency and nature of staff interactions with residents influence the way residents perceive the quality of their lives.

Besides nursing staff (RNs, LPNs, and CNAs), other relevant staff include: dietary staff, housekeeping staff, social service staff, activities staff, and therapy staff. A large complement of volunteers in direct contact with residents may also make a QOL difference, and perhaps a dedicated paid staff member to recruit, train, and supervise volunteers might be a pathway to a larger, more effective volunteer program. Any estimation of the necessary ratio of nursing department staff to residents must take into account the total staff-to-resident ratio with an emphasis on those staff members who directly interact with residents. Table 2 shows how selected aspects of staff numbers, qualifications, and deployment might be expected to affect quality of life; Table 2 is not meant to be comprehensive, but merely illustrative. Adequate or above-average numbers of nursing staff may, of course, be related to all of the QOL outcomes, especially when nursing constitutes most of the labor force. The "comfort domain" may be particularly responsive to nurse presence, and if the nursing staff emphasizes restorative nursing such as continence and mobility programs, "functional competence" may also have a direct link the numbers of nursing staff.

Table 6.2 Illustrative Features of Staffing That Might Affect QOL Domains

Staff feature	Aut.	Priv	Dig	Ind	Enj	Act	Rel	Sec	Comf	Fun c com	SpWB
Nursing department staff ratios (RN to resident ratio, RN/LPN to resident ratio, total nursing staff-to resident ratio)			T					T	TT	T	
Evening and weekend nurse ratios			T					T	TT	T	
Permanent staffing assignments				T			TT				
Use of payroll staff versus pools				T			TT				
Number, type and deployment of therapy personnel										TT	
Nurse practitioners/restorative nursing										TT	
Number, training, deployment of activities personnel	T			T	TT	TT	T				
Paid pastoral counselor				T			T				T
Number, training, and role of social work staff	T			T		T					
Number and deployment of volunteers, paid volunteer coordinator				T	T	T	T				
Model for care planning	T			T							

The literature abounds with statements about aspects of facilities that residents find important for the quality of their lives. Such statements are variously derived from empirical studies using focus groups (Abt Associates, 1996, National Citizens Coalition for Nursing Home Reform, 1985, Uman, 1995), questionnaires to residents or family members (Kane et al., 1997; Kane, Bell, Reigler, 1986), Q-sort studies with staff (Sano et al., 1999), systematic observations of residents (Lawton, Van Houtasma, & Klapper, 1996; Lidz, Fischer, & Arnold, 1991), anthropological and ethnographic study (Gubrium, 1993; Savashitsky, 1991; Schmidt, 1990; Shield, 1991; Tellis-Nayak and Tellis-Nayak, 1989;), and psychologically oriented research dealing with the search for identity and meaning among nursing home residents (Tobin, 1991). Another rich vein of insight is derived from autobiographical or thinly fictionalized accounts of life in nursing homes from those who have lives in them (Laird, 1985; Tulloch, 1975) or worked in them as nurse's aides (Bennett, 1980; Diamond, 1992; Foner, 1994; Henderson, 1995; Tisdale, 1987).

This body of diverse work yields remarkably consistent findings about what cognitively intact residents deem important. With reference to staff, residents tend to accord high importance, all things being equal, to continuity in the personnel who give them direct care. This finding, in turn, has caused some people to assume that high turnover of caregiving staff is associated with poorer QOL. In one of the few empirical studies of this topic, Patchner & Patcher (1993) found that permanent assignment did seem to improve quality of care, but they did not examine QOL outcomes. Residents also appreciate staff members who are kind, polite, gentle, responsive to their requests for help or information, and who demonstrate that they care about the residents as people. Residents tend to value having control over aspects of their daily lives, which, in turn, means that they value staff who are flexible in their responses to residents' wishes. The much-publicized Eden Alternative (Thomas, 1994) is predicated, in part, on the belief that if nursing assistants are empowered to make decisions, they will, in turn, be free to enable resident choice. The work of the Nursing Home Pioneers, an almost grass-roots movement of individuals who are attempting to bring about culture change in nursing homes (Fagin, Williams, and Burger, 1997; Lustbader, in press) is based on principles that emphasize the importance of making nursing homes places where the human spirit can flourish and residents and staff both can experience a sense of community. The pioneering efforts include the full gamut of environmental, structural and attitudinal change, ranging from total systems such as the Eden Alternative, to the creation of physical settings that resemble households and neighborhoods rather than institutions, and to efforts to create a viable community of residents and staff through community organizing techniques such as those pioneered at the Live Oak Regenerative Community in the California Bay Area (Barkan, 1995). Some of these innovative efforts are profiled in case studies in a 1995 book (Gamroth, Semradek, & Tornquist, 1995).

The insights from the literature and the pioneer efforts underway are compelling. They seem to have face validity. However, we could not locate studies that examine how any particular feature valued by residents, say, reducing turnover of nursing staff or permanent assignment of nursing staff or reduction

of average amount of time for answering call lights at various times of day are correlated with any or all QOL domains, or for that matter, even how they are correlated with quality of care. Similarly, the pioneering efforts have not as yet been rigorously evaluated though investigators are studying the process of culture change carefully and also identifying issues that interfere with QOL in conventional nursing homes (Dannefer, Stein, & Gelein, 1998).

When residents are substantially cognitively impaired evaluating their QOL is harder, let alone determining how nurse-to-resident ratios effect it. The creation of Alzheimer's Special Care Units (SCU) was motivated by a desire to create an environment and a complement of staff who could provide care in a way that was attentive to the QOL of people with dementia, while also offering a better QOL to those who are cognitively intact by a more homogeneous mix in terms of cognition and removal of some individuals with so-called behavioral disturbances. The National Institute on Aging's series of studies on SCUs did not generate strong consistent findings supporting SCUs, in part because of the great differences among SCUs and different norms, patterns, and case mix on units not designated formally as SCUs (Lawton, in press). On a more anecdotal level, those SCUs that seem to have made substantial changes in the nature of life in the nursing home have sometimes used persons other than nurses to coordinate the units, thus reducing their nurse-to-resident ratio on the particular unit.

In addition to their emphasis on various aspects of staff behavior, cognitively intact nursing home residents also cite other features that make their lives better or worse in nursing homes, including the quality of food and the ambiance at meal time; having a private room or having a compatible or at least not incompatible roommate (Lawton & Bader, 1970; Kane et al., 1997; 1999); getting outside during pleasant weather; being able to maintain contacts and communicate readily with relatives and friends outside the facility (Kane et al., 1997); getting a good night's sleep; and, for some cognitively intact residents, being spared frequent close contact with residents with dementia, particularly those whose behavior and demeanor are frightening or disturbing (Teresi, Holmes, & Monaco, 1993). Residents with advanced cognitive disabilities are unable to report reliably and completely what affects the quality of their lives. On their behalf, observers comment on some things that seem to afford pleasure (for example, music, other sensory stimulation) and those that bring misery (for example, forced baths, being physically tied down). Regarding bathing, Joanne Rader, herself one of the nursing home pioneers, has been developing approaches whereby bathing can be a more individualized and pleasant experience for residents (Rader, et al., 1996; Hoeffler et al., 1997). Efforts to measure quality of life for nursing home residents with dementia have accelerated in the last few years; the available tools include scales administered to residents, staff, and/or family (Brod et al., 1999a, 1999b; Logsdon, et al., 1999; Lawton, et al., 1999; Rabins et.al, 1999).

Although the review has found no studies linking nurse staff levels or other staff features to QOL as the investigators have defined it, an important distinction is needed. Failure to find empirical evidence linking relationships discussed in the literature to QOL outcomes, does not in itself disprove those

relationships. A major distinction must be made between studies that look for particular differences and fail to find them, compared to studies that examine a construct of interest, say permanent nurse assignments, to determine whether expected outcomes associated with the construct. As far as we can discern, investigators have simply not examined these many relationships between characteristics of staff and quality of life outcomes, which is quite different from examining them and finding them insignificant. It is also notoriously difficult to study staff roles and behavior in action. Counting numbers is much easier (though by no means straightforward). Because observation of staff behavior is so difficult, investigators resort to inadequate proxies for the desired behaviors; for example, one can measure how frequently staff development and orientation programs touch on dignity and how many staff-minutes are spent learning about dignity, much more readily than making observations of behavior that sustains or destroys the dignity of residents. Similarly, it is much easier to audit care plans for mention of strategies to enhance individuality than to determine whether those strategies are carried out. It is easier to assign positive points to a nursing home where social workers, activities personnel, pastors, and/or dietary personnel contribute directly to care plans than to determine whether such comprehensive, multidisciplinary care-planning led to something different in the residents' lives and, if so, to better QOL outcomes.

6.6.3 Plans for Developing QOL Indicators

In HCFA's ongoing QOL study, the investigators are examining many features of nursing homes that may be associated with QOL outcomes. Those concerning staff go beyond nursing staff to consider other staff members. In terms of nursing staff, we are, for example, examining: credentials; experience; and tenure of the Director of Nursing; presence or absence of other key positions in nursing, such as restorative care nurse, staff development coordinator, and wound care specialist; model used to complete the MDS (including the extent to which MDS completion is centralized in a few nurses or shared across caregiving staff and the extent to which MDS completion draws licensed nursing staff away from rather than toward direct care); model of nurse supervision (a unit-centered model versus a departmental model); permanency or length of nurse and nurse's aide assignment to residents; ratios of nursing staff to residents in the evenings and on the weekends; ratio of regular payroll staff to staff from agencies, pools, or registries as they are variously called; specific aide or assistance positions to transport or wheel residents around the facility or to enhance mobility; and flexibility and variation in the timing and performance of various routines such as getting residents up, putting them to bed, helping residents eat or feeding them, and bathing residents.

Regarding other staff besides nursing, the investigators are examining activities programs in terms of: the credentials of activities staff, the deployment of activities staff on weekends and evenings, the approach to record-keeping and individualizing of residents, and the nature and variety of programs developed. They are examining social work and therapy departments on similar parameters; with the latter they are interested in whether the program has an in-house versus a contracted therapy department, the ratio of therapists to residents, and the extent to which residents whose stay is not financed by Medicare Part A

receive evaluations or treatments from PT, OT, or speech therapists. The protocol also notes whether the facility has a paid pastoral counselor or director of a spirituality program and how that individual spends his or her time.

Although the investigators will encounter difficulties in examining such a large number of staff-related variables as well as other structural and process variables in relation to QOL in a study with only 40 nursing homes and about 120 nursing units, they expect to emerge with some data about key aspects of the facility, including its staff, that are associated with QOL outcomes.

Finally, the investigators note that the study design entails detailed, structured observations of staff-resident interactions in the facility as well as observations of the physical environments. Regarding the former, data collectors are completing facility walk-throughs at selected time periods and making stationary observations in dining rooms, activity areas, and lobby areas. They are noting positive interactions between staff and residents (e.g. a staff member pausing to answer a question, a staff member assisting a resident in distress, a staff member engaged in a conversation with a resident on a matter other than care) and negative interactions (e.g., staff moving residents in wheelchairs without discussion with them, staff discussing personal health matters relating to residents when others are present, staff ignoring residents who are in distress, staff conducting personal conversations over the head of a resident receiving care). Facilities often espouse a management principle that all staff from the Administrator on down must make a resident's needs paramount and interrupt their own activities to assist residents; we will be in a position to calculate whether positive interactions (that speak to outcomes like dignity, relationships, individuality, security, and comfort) occur and negative ones occur less in facilities with higher nursing department staff-to-resident ratios. In terms of physical environments, HCFA asked the investigators to give the physical design special attention. The study is exploring whether elements of the physical design effect QOL outcomes positively or negatively. It is likely that privacy, individuality, autonomy, and meaningful activity are deeply response to availability and use of space, including private space and the general ambiance in the nursing home. Staff may also respond positively to improved work environments and, indeed, be more efficient in them. If, indeed, physical environments make a big difference in resident QOL, policy-makers will face trade-offs between the likely costs of mandating staff ratios and the likely costs of environmental improvements.

6.6.4 Preliminary Observations

In preparing for this QOL study, the investigators wrote to all the nursing homes in the five catchments areas where the study sample was later drawn and, in a brief questionnaire, asked respondents to tell us what, if anything, they had been doing at their nursing homes to enhance QOL. Many of the responses dealt with staff preparation or deployment. Also since field work began, the investigators have been conducting interviews with key staff from administration, nursing, social work, activities, and (when applicable) pastoral counseling to collect indicator data and to learn how the nursing homes were structured. Even at this early point, it is obvious that staff are used in nursing homes in extremely varied

ways. For example:

- C Some nursing homes have almost abolished the concept of three shifts, using a great many overlapping shifts and partial shifts so as to ensure larger numbers of staff at peak times.
- C Some nursing homes have far more than the average numbers of nurses employed in administrative-type positions with clinical significance for the whole facility. Special nursing assignments to restorative nursing or clinical care complicate determining the ratio of nurses to residents on any unit. They also vary in the extent to which licensed nurses are used solely for the “paper” function of completing the MDS or, conversely, the way the MDS is used as an organizing force for all staff to plan care.
- C Some nursing homes have the regular presence of a geriatric nurse practitioner (GNP) for 4, 8, or 16 hours a week. Typically these nurse practitioners are employed by physicians or clinics practicing in the nursing home, but the presence of these GNPs is typically said to enhance the effectiveness of the nursing department.
- C Staffing shortages are almost (though not quite) ubiquitous and nursing homes use varying strategies to cope. Some use registries or pools heavily, whereas others prefer to ask staff to do extra shifts or have supervisory personnel do shifts. Some have made ingenious use of new types of positions (housekeeper, transport aide) or of nearby college students interested in part-time work. Some have in-house CNA training programs or choose to be practicum sites for LPNs and nurses in training; although personnel in training are typically not counted in staff-to-resident ratios, their regular presence is said to improve the capacity and responsiveness of staff.
- C In practice, most facilities do not differentiate between RN and LPN/LVN for most supervisory roles. Whether a RN or LPN is employed on a particular shift is typically a function of availability of personnel and the historical circumstances of who is on the payroll. Payroll for any given one-week period may reflect an atypical use of an RN instead of an LPN or vice-versa.
- C Numbers of people and FTEs in activities programs vary widely—for example from 1 person in one of our facilities to 20 people in several others (though the 20 would tend to constitute a much smaller number of FTEs, such as 6-10). Nursing homes vary in whether they pay some high school students for specific roles or expect such students all to volunteer, and whether they pay entertainers, and, for that matter, the size of the budgets under the discretion of the activities program.
- C The provision of social work varies enormously. We have encounter the following variations: the DON also serves as the director and only social worker; one social worker who has no

formal social work credential; multiple social workers with no formal social work credentials; one social worker with formal social work credentials; multiple social workers each of whom have formal social work education. The way that social workers construe their jobs also varies greatly as do the abilities of social workers and other personnel to tap mental health and social services resources from the larger community to be of service to the residents.

These and other variations in staff patterns and deployment in nursing and other departments leads us to speculate that sheer numbers of nursing staff to residents will not predict QOL. Rather it will probably be necessary to think of the numbers of nurses in the context of what the nurses do, as well as what other staff and human resources are present and what they do. Our ongoing study of QOL should help shed light on these matters. Moreover, although a minimum threshold may be needed for general staff-to-resident ratios and nursing department staff-to-resident ratios, it seems increasingly clear that achieving such numbers would never be sufficient to improve quality of life. The key issue would be what these staff literally do and how they behave in the nursing home.

6.7 Conclusion

This chapter has presented a review of selected research on nursing home staffing and resident outcomes. This is not a new topic and has been the subject of several research studies and expert meetings that have reviewed these studies. One such meeting of experts, referred to in previous chapters as the Hartford experts, has reviewed this research and made recommendations about appropriate minimum staffing ratios, including a recommended minimum of 4.55 total nursing hours per resident day, as was discussed in Chapter 3. These recommendations were published in a recent issue of the *Gerontologist* (Harrington et al., 2000). In addition to recommended minimum staffing ratios, the Hartford statement also made recommendations with respect to education and training, and the use of nurse practitioners, a recommended staffing issues that is outside the scope of our present study.

We have found that any conclusion on the association between staffing and outcomes derived from the reviewed studies would be based on small samples of limited representativeness, questionable outcome measures and risk adjustments, staffing measures of unknown accuracy, and findings that show no or very weak relationships between staffing and outcomes. We find no way to conclude on the basis of these reviewed studies that there is a strong and consistently positive association between staffing and quality of care outcomes.

However, it should also be acknowledged that none of the studies has found a significant negative relationship between staffing and quality. As such, this pattern suggests that better designed studies might produce the strong evidence claimed by the Hartford statement, but not found in our scrutiny of their evidence. This is not to suggest that the reviewed research was not professionally conducted. Many of the studies were limited by the data available to the investigators, as discussed above. Also, many of the studies were not primarily designed to investigate the impact of staffing on outcomes; often

this was a secondary objective or a by-product of another analysis, e.g., to evaluate the impact of Ombudsmen programs, reimbursement, or whether for-profit and not-for-profit homes behave differently. Hence, there is a need for a comprehensive study specifically designed to address the problems identified in the above studies and provide a more definitive assessment of the relationship between staffing and quality problems. It is just such a study that has been conducted for this Report and is presented in the following chapters.

Even if the above evidence on the association between staffing and quality had been stronger and more consistent, *none of the reviewed studies were even designed to identify a critical ratio of nurses to residents below which nursing home residents are at substantially increased risk of quality problems.* A positive association between nurse staffing and quality outcomes is consistent with many very different critical ratio thresholds. The existence and identification of potential thresholds is necessary in order to formulate recommendations for minimum staffing requirements that are potentially effective and efficient for improving quality outcomes. Relevant evidence with respect to specific ratios will can only be generated from research designed to answer that question, as will be found in the analyses presented in subsequent chapters.

As was discussed in Chapter 1, expert consensus is one of the three research strategies that can be used to address our general study question of appropriate minimum staffing ratios. Although we have not assembled an expert panel to make recommendations, the Hartford experts were convened recently in April 1998 and their recommendations were published this year, 2000. We draw upon their published statement here in this chapter.

We have found it difficult to reconcile our review of selected research on the relationship between nurse staffing and resident outcomes with the Hartford Statement's findings and recommendations as published in *The Gerontologist*. The same studies we reviewed in this chapter are cited in the *Gerontologist* article as consistently showing "the positive relationship between higher nurse staffing levels, especially RN staff, and the outcome of nursing home care." But our examination of the cited studies calls into question how "positive" and how "consistent" and other study design elements which limit what can be concluded from these studies. Perhaps more importantly, as noted above, even if the above evidence on the association between staffing and quality had been stronger and more consistent, none of the reviewed studies were even designed to identify a critical ratio of nurses to residents below which nursing home residents are at substantially increased risk of quality problems.

Although we are unclear as to how the Hartford participants arrived at their recommendations, the statement identified a number of other aspects of staffing that would eventually have to be address in any consideration of a minimum staffing ratio. These include recommendations with respect to education and training, use of nurse practitioners, allocation of staff between shifts, and allocation of staff between administrative and direct care activities.

In addition to the studies reviewed above on the relationship between staffing and resident outcomes, other research cited in the Hartford statement and/or our review indicates that there are independent data sources indicating a relatively high percentage of residents needing assistance with eating and a relatively low CNA to resident ratio to meet this need. In addition, there is some dramatic evidence from an intensive qualitative study of two nursing homes that finds eating problems of nursing home residents are primarily due to inadequate staff. However, as we noted in this chapter, we have not identified any research analyzing the relationship between measures of nurse staffing to nutritional problems for a sufficiently large sample of nursing homes. Although the qualitative observations are dramatic and compelling, without a quantitative study conducted over more homes, the Hartford position that staffing numbers (as well as other aspect of staffing) are an important cause of malnutrition must be regarded as a compelling hypothesis, but not confirmed.

Our study conducted for this Report has focused on the potential impact on quality of one structural measure or construct, nursing home staffing ratios. Clearly, there are other non-ratio aspects of staffing which are important, perhaps more important than sheer numbers alone represented by staffing ratios. A number of studies, usually qualitative, suggest that there maybe a number of non-ratio staffing factors and work organization practices that impact importantly on quality outcomes. Some of these workforce factors that seem to favor high quality performance are use of teams of nurse aides, the sharing of information about patient care with nurse aides; involvement of families and aides in the organization of work and care; provision of on-the-job training and feedback to nurse aides, lower turnover, higher benefits, and career paths for nurse aides. Although these other factors are beyond the scope of our Phase 1 study, we anticipate a closer scrutiny in these areas when we conduct qualitative case studies for our Phase 2 study. This will be particularly important in explicating apparent anomalies in the data - e.g., low staffed facilities that have particularly good quality outcomes.

Researchers and HCFA regulations often distinguish between what are referred to as quality of care practices and outcomes (e.g., bathing, toileting, feeding, pressure ulcers, urinary tract infections, etc.) from the care processes and nursing home environment which enhances residents' dignity; individuality; autonomy/choice; sense of privacy; enjoyment; meaningful activity; relationships; sense of security/order; comfort; spiritual well-being, and functional competence. (See discussion below). These latter outcomes are often referred to as Quality of Life (QOL) outcomes. With a few debatable exceptions, the outcome studies reviewed in this chapter would fall under the rubric of quality of care.

Although an analysis of the impact of nurse staffing on these other aspects are beyond the scope of this study, a review of research by Rosalie Kane (University of Minnesota) on the relationship between nursing staff ratios and quality of life is presented together with a few preliminary observations from an ongoing study.

The review finds it doubtful that sheer numbers of staff in nursing are unlikely to be important determinants of QOL: "Beyond numbers is the question of what staff actually do, how well they do it,

how their roles and tasks are defined, whether they are present in sufficient numbers on weekends and evenings, and whether their jobs are structured so that they have the opportunity to know residents as people, and whether they are expected to respond to resident's request and wishes." Preliminary observations reveals an enormous variation in the way staff are used in nursing homes. For example, some nursing homes have almost abolished the concept of 3 shifts; some nursing homes have the regular presence of a nurse practitioner for 4, 8, or 16 hours a week; staffing shortages are almost (though not quite) ubiquitous and nursing homes use varying strategies to cope; numbers of people and FTEs in activities programs vary widely; etc.. These and other variations in staff patterns and deployment in nursing and other departments leads the investigators to speculate that sheer number of nursing staff to residents will not predict QOL. Rather it will probably be necessary to think of the numbers of nurses in the context of what the nurses do, as well as what other staff and human resources are present and what they do.

Chapters 7 through 14 for this Report to Congress: *Appropriateness of Minimum Nurse Staffing Ratios in Nursing Homes*, can be found in Volume II. Appendices are located in a separate volume as well.

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